

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 16 February 2001 (16.02.01)	
<b>International application No.</b> PCT/US00/15754	<b>Applicant's or agent's file reference</b> 18024-2-PC
<b>International filing date</b> (day/month/year) 08 June 2000 (08.06.00)	<b>Priority date</b> (day/month/year) 08 June 1999 (08.06.99)
<b>Applicant</b> VANDEZANDE, Gerald, A. et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
 22 December 2000 (22.12.00)

☐ in a notice effecting later election filed with the International Bureau on:  
 \_\_\_\_\_

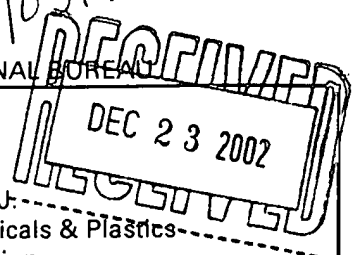
2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  Olivia TEFY  Telephone No.: (41-22) 338.83.38
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## PATENT COOPERATION TREATY

10/03/803



PCT

From the INTERNATIONAL BUREAU

To:

PACCIONE, Stanley, J.  
 Union Carbide Chemicals & Plastics  
 Technology Corporation  
 39 Old Ridgebury Road  
 Danbury, CT 06817-0001  
 United States of America

NOTIFICATION OF THE RECORDING  
OF A CHANGE

(PCT Rule 92bis.1 and  
 Administrative Instructions, Section 422)

Date of mailing (day/month/year) 24 octobre 2002 (24.10.02)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 18024-2-PC	
International application No. PCT/US00/15754	International filing date (day/month/year) 08 juin 2000 (08.06.00)

## 1. The following indications appeared on record concerning:

☒ the applicant ☒ the inventor ☐ the agent ☐ the common representative

Name and Address VANDEZANDE, Gerald, A. OLESEN, Keith, R.	State of Nationality CA	State of Residence US
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

## 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☐ the name ☐ the address ☐ the nationality ☐ the residence

Name and Address VANDEZANDE, Gerald, A. OLESEN, Keith, R.	State of Nationality CA	State of Residence US
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

## 3. Further observations, if necessary:

**Correction of status. The aforementioned individuals are applicants and inventors for the US only.**

## 4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned  
☐ the International Searching Authority ☒ the elected Offices concerned  
☐ the International Preliminary Examining Authority ☐ other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Philippe Bécamel Telephone No.: (41-22) 338.83.38
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## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>18024-2-PC</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 b low.	
International application No. <b>PCT/US 00/15754</b>	International filing date (day/month/year) <b>08/06/2000</b>	(Earliest) Priority Date (day/month/year) <b>08/06/1999</b>
Applicant <b>Union Carbide Chemicals &amp; Plastics</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. \_\_\_\_\_

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/15754

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08F220/04 C08F220/12 C08G18/72 C08G18/28 C08F290/06

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08F C08G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 102 936 A (HUTH HANS-ULLRICH ET AL) 7 April 1992 (1992-04-07) claims 1,3,8 ---	1-11
A	US 4 514 552 A (SHAY GREGORY D ET AL) 30 April 1985 (1985-04-30) cited in the application claims 1-13 ---	1-11
A	US 5 629 375 A (JENKINS RICHARD D ET AL) 13 May 1997 (1997-05-13) claims 1-4 example 63 column 9, line 12-30 --- -/-	1-11

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*G\* document member of the same patent family

Date of the actual completion of the international search

25 September 2000

Date of mailing of the international search report

06/10/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Rose, E

# INTERNATIONAL SEARCH REPORT

International Application No

P2/US 00/15754

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 294 693 A (EGRAZ JEAN-BERNARD ET AL) 15 March 1994 (1994-03-15) cited in the application claim 1 examples TEST,24	1-11
A	US 5 912 293 A (STOCKWELL JOHN ROBERT ET AL) 15 June 1999 (1999-06-15) claims 1-8 examples 1,2 column 3, line 33-35	1-11

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/15754

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5102936	A	07-04-1992	DE 3935137 A	25-04-1991
			AU 635076 B	11-03-1993
			AU 6477990 A	26-04-1991
			CA 2028041 A	22-04-1991
			DE 59009283 D	27-07-1995
			EP 0424751 A	02-05-1991
			ES 2075109 T	01-10-1995
			JP 3170517 A	24-07-1991
US 4514552	A	30-04-1985	AU 573021 B	26-05-1988
			AU 4613685 A	27-02-1986
			CA 1278893 A	08-01-1991
			DE 3573787 D	23-11-1989
			EP 0173109 A	05-03-1986
			ES 547197 D	16-07-1987
			ES 8706781 A	16-09-1987
			ES 553424 D	16-05-1987
			ES 8705499 A	16-07-1987
			JP 1943616 C	23-06-1995
			JP 6078412 B	05-10-1994
			JP 61060719 A	28-03-1986
			NZ 213201 A	28-07-1988
			PT 80946 A,B	01-09-1985
			US RE33156 E	30-01-1990
US 5629375	A	13-05-1997	US 5561189 A	01-10-1996
			US 5476900 A	19-12-1995
			US 5436292 A	25-07-1995
			US 5399618 A	21-03-1995
			AT 154812 T	15-07-1997
			AU 702693 B	04-03-1999
			AU 7315294 A	17-01-1995
			CA 2166195 A	05-01-1995
			DE 69403967 D	31-07-1997
			DE 69403967 T	20-11-1997
			EP 0706535 A	17-04-1996
			ES 2105737 T	16-10-1997
			FI 956274 A	27-02-1996
			JP 8512064 T	17-12-1996
			NO 955315 A	20-02-1996
			PL 307744 A	12-06-1995
			WO 9500565 A	05-01-1995
US 5294693	A	15-03-1994	FR 2693203 A	07-01-1994
			CA 2096083 A	02-01-1994
			EP 0577526 A	05-01-1994
			FI 933006 A	02-01-1994
			NO 931692 A	03-01-1994
			US 5362415 A	08-11-1994
US 5912293	A	15-06-1999	AU 695707 B	20-08-1998
			AU 2843195 A	29-02-1996
			CA 2155779 A	19-02-1996
			DE 69507402 D	04-03-1999
			DE 69507402 T	10-06-1999
			EP 0697423 A	21-02-1996
			ES 2126844 T	01-04-1999
			FI 953906 A	19-02-1996

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/15754

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5912293 A		GR 3029964 T	30-07-1999
		NO 953231 A	19-02-1996
		NZ 272776 A	25-06-1996
		PL 310039 A	19-02-1996
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CORRECTED VERSION

10/031803

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
14 December 2000 (14.12.2000)

PCT

(10) International Publication Number  
WO 00/075205 A1

(51) International Patent Classification<sup>7</sup>: C08F 220/04,  
220/12, C08G 18/72, 18/28, C08F 290/06

(21) International Application Number: PCT/US00/15754

(22) International Filing Date: 8 June 2000 (08.06.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/138,086 8 June 1999 (08.06.1999) US

(81) Designated States (*national*): AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ZA.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): UNION CARBIDE CHEMICALS & PLASTICS TECHNOLOGY CORPORATION [US/US]; 39 Old Ridgebury Road, Danbury, CT 06817-0001 (US).

Published:  
— with international search report

(71) Applicants and

(72) Inventors: VANDEZANDE, Gerald, A. [CA/US]; 1221 Shincliffe Court, Cary, NC 27511 (US). OLESEN, Keith, R. [CA/US]; 300 Carpenter Town Lane, Morrisville, NC 27560 (US).

(48) Date of publication of this corrected version:  
26 September 2002

(74) Agent: PACCIONE, Stanley, J.; Union Carbide Chemicals & Plastics, Technology Corporation, 39 Old Ridgebury Road, Danbury, CT 06817-0001 (US).

(15) Information about Correction:  
see PCT Gazette No. 39/2002 of 26 September 2002, Section II

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: WATERBORNE THICKENERS AND DISPERSANTS HAVING IMPROVED CHEMICAL RESISTANCE

(57) Abstract: Improved dispersants and thickeners for use with latex polymers are disclosed which are polymerized from monomers having crosslinking functionality or elevated levels of macromonomers, or both. Latex polymers suitable for use with the thickeners and dispersants of the present invention can be prepared by a two stage polymerization of a first stage polymer and a second stage polymer wherein a monomer having crosslinking functionality is included in either the first stage polymer, the second stage polymer, or both.

WO 00/075205 A1



-36-

Claims:

1. A polymer polymerized from monomers including:
  - (i) an unsaturated carboxylic acid monomer;
  - (ii) a monoethylenically unsaturated monomer different from the carboxylic acid monomer; and
  - (iii) a macromonomer comprising a hydrophobic portion and an alkoxyated portion which is polymerizable with the carboxylic acid monomer and the monoethylenically unsaturated monomer;characterized in that the monomers further comprise from about 0.5 to 50 wt. %, based on the total weight of the polymer, of at least one monomer having crosslinking functionality.
2. The polymer of claim 1 wherein said monomer having crosslinking functionality comprises a carbonyl-containing monomer.
3. The polymer of claim 2 wherein said monomer is selected from the group consisting of acrolein, methacrolein, diacetone acrylamide, diacetone methacrylamide and vinylaceto acetate.
4. The polymer of claim 1 wherein the amount of the monomer having crosslinking functionality is from about 5 to 50 wt. %, based on the total weight of the polymer.
5. The polymer of claim 1 having a number average molecular weight of from about 5,000 to 20,000 g/gmol.

-37-

6. The polymer of claim 1 having a number average molecular weight of from about 20,000 to 200,000 g/gmol.

7. The polymer of claim 1 wherein the amount of the macromonomer is from about 5 to 50 wt. % based on the total weight of the polymer.

8. The polymer of claim 1 wherein the amount of the macromonomer is from about 1 to 20 wt. % based on the total weight of the polymer.

9. A polymer polymerized from monomers including:

- (i) an unsaturated carboxylic acid monomer;
- (ii) a monoethylenically unsaturated monomer different from the carboxylic acid monomer; and
- (iv) a macromonomer comprising a hydrophobic portion and an alkoxylated portion which is polymerizable with the carboxylic acid monomer and the monoethylenically unsaturated monomer;

characterized in that the amount of the macromonomer is from about 0.5 to 50 wt. % based on the total weight of the polymer.

10. The polymer of claim 1 wherein the amount of the macromonomer is from about 5 to 40 wt. % based on the total weight of the polymer.

11. The polymer of claim 9 wherein the hydrophobic portion of the macromonomer is from 1 to 30 carbon atoms.

REC'D 03 JUL 2001

WIPO

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference ACH/56632/000	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/15754	International filing date (day/month/year) 08/06/2000	Priority date (day/month/year) 08/06/1999
International Patent Classification (IPC) or national classification and IPC C08F220/04		
Applicant Union Carbide Chemicals & Plastics et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand  22/12/2000	Date of completion of this report  29.06.2001
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Rouault, Y  Telephone No. +49 89 2399 8524  

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US00/15754

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, pages:**

1-35 as originally filed

**Claims, No.:**

1-16 as received on 15/06/2001 with letter of 13/06/2001

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/US00/15754

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-16
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-16
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-16
	No:	Claims	

**2. Citations and explanations**  
**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following documents:

D1:US-A-5102936

The examples 1-5 of D1, which is considered to represent the most relevant state of the art, disclose a latex including:

- (i) an unsaturated carboxylic acid monomer
- (ii) a monoethylenically unsaturated monomer different from the unsaturated carboxylic acid monomer
- (iv) a urethane macromonomer comprising a hydrophobic portion and an alkoxyated portion which is polymerizable with the carboxylic acid monomer and the monoethylenically unsaturated monomer

The latex is disclosed as such before a complete or partial neutralization and the wording of claim 9 of the present application does not exclude salt monomers.

The subject-matter of claim 1 of the present application differs from the subject matter of the examples of D1 in that a monomer having crosslinking functionality is not cited. However, in claims 1 and 3 of D2, (see (f)), there is a clear incentive to use such monomers. Even acrolein is cited as possible compound (e).

However, in D2,

- i) none of the examples contains acrolein or any latent crosslinker as cited in claim 3 of the present application.
- ii) the crosslinkers are only used to achieve higher molecular weight and not as latent crosslinkers.

The present set of claims is novel (Art. 33(2) PCT).

The present set of claims is also based on an inventive step (Art 33(3) PCT).

The documents cited in the search report, even if combined, could not lead to the present invention.

**The industrial applicability (Art 33(4) PCT) is obvious.**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/US00/15754

**Re It m VIII**

**Certain observations on the international application**

The tables for the examples' series C and E are missing. It is not clear if they fall within the scope of the claims (Article 6 PCT).

The relative term **about** used in the description and in the claims has no well-recognised meaning and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claims unclear (Article 6 PCT).

The vague and imprecise statement in the description on page 35 ("... spirit of the invention ...") implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them (see also the PCT Guidelines, III-4.3a).